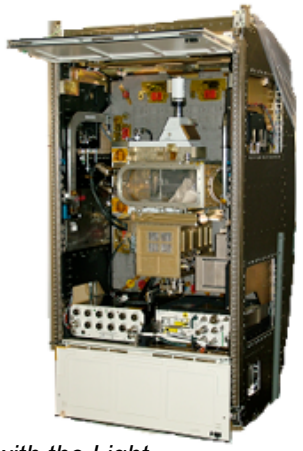
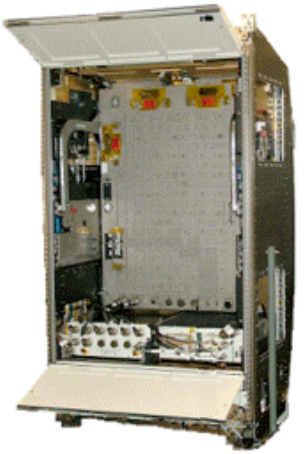
Fluids Integrated Rack (FIR)

Glenn Research Center

PM: Ronald Sicker, NASA GRC
Engineering Team: ZIN Technologies, Inc.



FIR with the Light Microscopy Module



FIR Flight Unit

Objective:

- Develop a flexible, easily configurable, multi-use facility that provides core diagnostics and data acquisition & control capabilities that will support a broad range of research in support of Space Exploration and other endeavors.

Relevance/Impact:

- The Fluids Integrated Rack (FIR) will support strategic research to enable storage/transfer of two-phase fluids, characterize two-phase heat transfer, support development of multi-phase environmental controls for life support systems, and support human health in physiological/medical systems research to enable long term missions to the Moon and Mars.

Development/Operations Approach:

- The FIR is part of the Fluids & Combustion Facility (FCF).
- The FCF system consists of a Flight Segment (flight rack & payload hw/sw) and a Ground Segment (integration/spares).
- All avionics and diagnostics are contained in orbital replacement units with simple interfaces that allow for easy change-out/reconfiguration.
- FCF operates together with payload experiment equipment, ground-based operations facilities and the FCF ground segment.
- The FIR is designed for remote/autonomous operations performed from GRC's Telescience Support Center.

ISS Resource Requirements

Accommodation (carrier)	ISS US Laboratory
Upmass (kg) (w/o packing factor)	745 (includes upmass for stowed ARIS hardware)
Volume (m^3) (w/o packing factor)	0.12 (off-rack ascent volume)
Power (kw) (peak)	1.1 (planned) 2.6 Peak (tested)
Crew Time (hrs) (initial installation & setup)	6
Launch/Increment	17A/Increment 10 ->

Project Life Cycle Schedule

Milestones	SCR	HCR	PDR	CDR	VRR	Safety	FHA	Launch	Ops	Return	Final Report
Actual/ Baseline	N/A	6/1998	2/2001	5/2002	2/2003	7/2005	5/2007	8/2009	Inc. 20,21 ->	N/A	N/A
Documentation	Website: eRoom:				SRD: EDMP:			Project Plan: SEMP:			

Revision Date: 9/22/2008